NOTES, ABSTRACTS, AND REVIEWS.

VISIBILITY AND WEATHER FORECASTING.[1]

551.591 : 551.509(048)

By A. GOCKEL.

[Abstracted from *Meteorologische Zeitschrift*, March, 1921, pp. 78-82.]

A high degree of visibility of distant terrestrial objects generally indicates that rain is soon to be expected. From 15 years' observations of the visibility of the Bernese Alps made from Freiburg (Switzerland), the conclusion is that rain follows within two days after high visibility, in 72 per cent of the observed cases.

The influence of precipitation upon the transparency of the air has been taken into account and the number of days between high visibility and the preceding rain has been obtained. The visibility of the Alps very often occurs on the second day after the end of precipitation.

A very interesting application to weather forecasting is that in summer when the visibility is not due to precipitation in the preceding 48 hours, rain is to be expected within 2 days in 85 per cent of all the cases. According to Melander's observations, which are confirmed by Aitken and Jenrich, the condensation nuclei do not injure the transparency. The wind velocity being small and the visibility good, often the nuclei are accumulated near the ground and do not influence the transparency so long as the saturation point has not been reached.

Measures of atmospheric polarization also offer very useful data for determining visibility. The clearer the air is, the greater is the proportion of polarized skylight. Above-normal values of polarization are followed in summer by thunderstorms and in winter by precipitation within 48 hours. Subnormal values of polarization with a clear sky indicate increasing cloudiness within a few hours. The polarization measures fail to give any indication of the atmospheric transparency when the sky is overcast with cirri or cirro-stratus. In this case, the polarization is small, while distant objects are clearly visible.—*J. P.*

551.509 (048) (44)

THE FORECASTING PROBLEM.[2]

By L. DUNOYER and G. REBOUL.

[Abstracted from *Le Journal de Physique*, May, 1921, pp. 129-139.]

Called upon for information by the Bombardament Groups of the French Air Service, the authors established a meteorological station near Nancy in 1915, and proceeded to give daily meteorological reports and forecasts for the following 24 hours. At first an attempt was made to employ exclusively the rules of forecasting devised by G. Guilbert, but experience necessitated a departure from this method.

The following reports and data were available: (1) Synoptic reports furnished by the Bureau Central Météorologique, which covered western Europe, and enabled the isobaric map to be drawn; (2) aerological soundings, made at the home station and others along the front; (3) local observations of barometer, thermometer, hygrometer, and anemometer, and the *state of the sky*. A numerical measure of the accuracy of the forecast (*coefficient de certitude*) was employed and was arrived at in a mechanical way.

Many rules were employed, each having to do with a specific phenomenon, as, for example, deductions regarding the barometric distribution from barometric tendency; wind tendency (decreasing or increasing wind velocity), wind directions,[3] both at the surface and aloft; temperature tendency; the direction of movement and speed of cirrus clouds.[4]

An example of the meteorological situation in France on January 24, 1917, is given in tabular form, and shows the method of arriving at the odds in favor of the forecast. For instance, it was indicated independently by rules regarding *six* of the weather elements that a Mediterranean depression would move northward; by rules regarding *five* of the elements that a LOW would move in over the British Isles and the north of France; by rules regarding *three* of the elements that a HIGH over Norway would remain stationary, and by *one* of the elements that it would move southward. The first two considerations give the relative certainty that the Mediterranean LOW would move northward and the British Isles LOW would cover northern France. There was more uncertainty regarding the Norwegin HIGH but the chances were three to one that it would remain stationary. The map of the following day verified the conclusions based on these considerations.

The authors express great confidence in their method and state the belief that a careful discussion of 10 years of records will lead to a high degree of forecasting accuracy in France.—*C. L. M.*

[1] *Durchsichtigkeit der Atmosphäre und Wetterprognose.*
[2] *Le problème de la prévision du temps.*

SQUALLS AT NIGHT ON THE LEE SIDE OF A MOUNTAINOUS ISLAND.

[Reprinted from *The Meteorological Magazine*, London, March, 1921, 56:42.]

The following extract from the meteorological log of the S. S. *Krasnoiarsk* (Capt. W. Tingey; observer, Mr. E. J. Berry) is reproduced from the same chart as the note on p. 40:

Whilst passing to the northward of Sokotra between 7 p. m. and 2.30 a. m. on August 5 and 6, 1920, distance about 7 miles off, violent squalls were experienced, clearly defining the causes of wind. Between the squalls, which were of one-half to one hour duration, force of wind was about 2 to 3. The temperature was then about 80° F., which during the squalls fell to 74° F. The warm atmosphere seemed to be rising and forming cloud in the zenith, the cooler air rushing in to take its place, sweeping obliquely from the mountains, causing squalls of about force 8. Before and after clearing the lee of the island the force of monsoon was 5.

Sokotra is an island in the Indian Ocean, about 200 miles from the Arabian coast. Its length from east to west is 71 miles, its greatest breadth 22. The peaks of the central mass rise to about 4,000 feet. The log of the *Krasnoiarsk* shows that the sea temperature was about 70° F.

THE CHARACTERISTICS OF GALES ON THE COAST OF VENEZUELA.

[Reprinted from *The Meteorological Magazine*, London, March, 1921, 56:42.]

A note received from Senor L. Ugueto, Director of the Observatorio Cajigal, states that the season of gales on the coast of Venezuela extends normally from December to the middle of March, but occasionally begins even in October. The wind blows from W. or NW. on several

[3] *Cf.* Reboul and Dunoyer: Wind circulation as a basis for forecasting the location of pressure areas. Abst. in MO. WEATHER REV., April, 1920, 48: 221.
[4] *Cf.* Reboul and Dunoyer: On the use of cirrus in the forecasting of weather. Abst. and disc. in MO. WEATHER REV., March, 1920, 48: 156.

successive days, reaching a maximum in the afternoon or early evening, and falling off in the night and early morning. The winds are cold, bringing temperatures of 45° F. or even less, and humid, but they are accompanied by a clear sky with only a few sirrus or cirro-cumulus clouds. They are generally associated with a slight fall of the barometer. At other seasons of the year less violent winds from the same direction bring overcast skies and heavy rain.

The gales from E. or SE. are less violent; they occur always between noon and 16 h. [4 p. m.], are warm and dry, with a clear sky, and have no appreciable relation to the barometer. They are evidently Föhn-like winds from the mountains of Macarao and Los Teques, which rise to 2,500 m. a few kilometers to the ESE.

THE DROUGHT IN ENGLAND.

[Reprinted from *Nature*, June 23, 1921, p. 535.]

Dry weather has been persistent in England during several months, and now that we are more than halfway through the first month of summer the absence of rain has become serious. The observations at Greenwich, which very fairly represent England, show that the conditions are most exceptional. The Greenwich rainfall was below the normal for each of the eight months from October, 1920, to May, 1921, and compared with the average for 100 years the deficiency of the period is 6.21 inches, approximately equal to the normal rainfall for the four months, February to May. There have, however, been only two months, November and February, with the rainfall less than 1 inch. The total measurement of rain for the eight months is 9.32 inches, which is 60 per cent of the average. An examination of the Greenwich observations for the last 105 years shows only one corresponding period as dry, the rainfall for October, 1879, to May, 1880, amounting to 8.24 inches, a deficiency of 7.29 inches. October, 1873, to May, 1874, had 9.60 inches of rain, and the next driest was apparently October, 1897, to May, 1898, with 10.50 inches. There have been several spring droughts in the last 100 years, and for the four months, February to May, there have been 10 years with the total measurement less than 4 inches. This year the measurement for February to May is 3.78 inches. The years with the smallest measurements for the corresponding period are 1834 with 2.60 inches, 1857 with 2.76 inches, 1863 with 2.90 inches, and 1874 with 3.16 inches. Temperature throughout the past eight months was abnormally high, the mean for each month at Greenwich being above the average and the excess for the whole period 2.3°.

NEW BRAZILIAN METEOROLOGICAL ORGANIZATION.

Members of the Weather Bureau staff are in receipt of *Foreign Bulletin No. 1*, dated June 28, 1921, and signed by Dr. J. de Sampaio Ferraz, the new director of the Brazilian Meteorological Service. The following paragraphs, quoted from the *Bulletin*, will show the scope of the work contemplated by the new organization:

I have the honor of advising you that the "Directoria de Meteorologia Astronomia" of the Brazilian Department of Agriculture has been divided in two separate services, "Directoria de Meteorologia" and "Observatorio Nacional."

The new "Directoria de Meteorologia," which was placed under my direction, will continue the climatological work established in 1909, uniformizing methods of all meteorological activities in the country and publishing all available data of the last ten years. I hope to be able to put out nine yearly bulletins by the end of this year. The Directoria will also establish a forecast service for central and southern Brazil; an aerological service for the aviators and general progress of meteorological science, creating kite and pilot balloon stations; a special coast service for navigation; an agricultural meteorology service; a marine meteorological service; a special service of rains and floods, and the usual investigations in every department of meteorology, principally those which may lead us, possibly, to longer ranges in forecasting weather. The Directoria will strive to explore conditions over land and ocean, in and near Brazil, and do its best to present rapidly the results to every meteorological institute of the world, being very pleased to receive their suggestions and counsel. All information concerning the whole of Brazil will be promtply given with pleasure. Rio Grande do Sul, Minas Geraes, and S. Paulo continue with their State services but under the supervision of the Directoria. The Reclamation Service of semiarid northeastern Brazil will maintain their rain organization.

The Directoria will be able to attend to any foreign requests of data from these separate services.

* * * * *

Attention is called to the fact that the old "Directoria de Meteorologia da Marinha" does not exist any more. It was extinguished many years ago.

METEOROLOGICAL STATION ON NAVASSA ISLAND.

In cooperation with the Naval Radio Service a special meteorological station has been established by the Weather Bureau on Navassa Island, West Indies. Masters of vessels that pass near Navassa may have their ship barometers checked by a standard instrument upon wireless request to the naval radio station at that point